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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Gary Dean Martinie

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5107

7590

11/16/2009

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EXAMINER

ROBINSON, RENEE E

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/583,784	<b>Applicant(s)</b> MARTINIE ET AL.	
	<b>Examiner</b> RENEE ROBINSON	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 July 2009.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 2,3 and 6-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2,3 and 6-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)         | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Amendment*

1. Amendments to claims 2, 3, 6, 7, 10, 12 and 14, cancellation of claims 1, 4 and 5, and addition of new claims 15-20 in the reply filed 16 July 2009 are noted.
2. Objection to the specification is withdrawn.
3. Due to amendments to the claims, the previous rejection is withdrawn. New rejection follows. Examiner's response to the arguments follows the rejection.

### *Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 2, 3, 6, 12, 14-16 and 18-20 are rejected under 35 U.S.C. 102(b) as being anticipated by Keyworth (US 4,816,139).**
6. Regarding claims 15, 16, 19 and 20, Keyworth teaches a process for the removal of sulfur compounds from a hydrocarbon stream comprising contacting the hydrocarbon stream containing sulfur compounds with aqueous sodium hypochlorite under conditions and for a period of time which is sufficient to reduce the sulfur content of the hydrocarbon stream (see col. 2, lines 42-53). Keyworth does not expressly disclose that the reaction between the extractive agent (aqueous sodium hypochlorite) and the sulfur compounds form ionic reaction products which are soluble in water, as per claim

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15, or that they form water soluble chlorosulfonium ions as reaction products as a result of sulfur atoms in the sulfur compounds combining with a chloronium ion, as per claims 19 and 20. Nevertheless, given that Keyworth expressly teaches contacting the hydrocarbon stream with aqueous sodium hypochlorite, which is claimed as a suitable reactive extractive agent, the reaction products are understood to be an inherent result of contacting the hydrocarbon stream with the extractive agent. Thus, Keyworth is understood to teach all of the limitations of claims 15, 19 and 20.

7. Regarding claim 2, Keyworth teaches a liquid hydrocarbon stream (see col. 2, lines 42-43; col. 5, lines 46-54).

8. Regarding claim 3, Keyworth discloses that sulfides, disulfides, carbon disulfide are among the sulfur compounds contained in the hydrocarbon stream (col. 4, lines 23-28).

9. Regarding claims 6 and 18, the claimed cyanuric acid and its salts merely limit the types of cyanuric acid and its salts that are suitable for the process of claim 15. However, the claim language does not require that the reactive extractive agent of claim 15 is limited to one of the claimed cyanuric acid and its salts. Therefore, since Keyworth teaches one of the reactive extractive agents of the Markush group of independent claim 15 (i.e. the hypochlorite), the Keyworth references teaches all of the claim limitations required by claims 6 and 18.

10. Regarding claim 12, Keyworth teaches stirring and/or agitating (intimately mixing) the hydrocarbon stream in a contactor containing the aqueous sodium hypochlorite (col. 2, lines 42-50).

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11. Regarding claim 14, Keyworth teaches that the sulfur content in the hydrocarbon stream is reduced to 2.5 ppm (col. 6, lines 15-17).

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**15. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keyworth (US 4,816,139).**

16. Keyworth is relied upon as set forth above in the rejection of claim 15.

17. Regarding claim 10, Keyworth teaches that the hydrocarbon stream is dispersed in the aqueous solution of sodium hypochlorite in order to ensure thorough contacting (col. 2, lines 48-50). Keyworth does not expressly disclose that the process is continuous. Nevertheless, making continuous would have been an obvious modification to a person of ordinary skill in the art at the time the invention was made in light of the process of the prior art. *In re Dilnot*, 319 F.2d 188, 138 USPQ 248 (CCPA 1963).  
MPEP 2144.04 V E.

**18. Claims 7-9, 11 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keyworth (US 4,816,139) in view of Eberly, Jr. (U.S. Patent 4,592,829).**

19. Keyworth is relied upon as set forth above in the rejection of claims 15, 10 and 12.

20. Regarding claims 7-9, 11 and 13, Keyworth does not expressly disclose contacting the hydrocarbon stream in the presence of a catalyst selected from the group consisting of transition metal oxidation catalysts and supported catalysts.

21. Eberly discloses a process for the desulfurization of hydrocarbons comprising contacting a hydrocarbon stream containing sulfur compounds with a supported catalyst or sorbent, thereby providing a hydrocarbon stream with a lower sulfur concentration (col. 3, lines 24-31). The catalytic sorbent comprises metals such as iron and nickel

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supported on a refractory inorganic oxide, such as silica, alumina, and clays (col. 3, lines 12-23). The resulting hydrocarbon stream contains less than 0.1 ppm sulfur, which is an immeasurable amount (col. 5, lines 64-68).

22. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the process as disclosed by Keyworth such that the contacting step takes place in the presence of a transition metal catalyst, as suggested by Eberly. One having ordinary skill would have been motivated to do this in order to further reduce the amount of sulfur in the hydrocarbon stream to immeasurable amounts.

**23. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Keyworth (US 4,816,139) in view of Sughrue et al (US 2004/0007501).**

24. Keyworth is relied upon as set forth above in the rejection of claim 15.

25. Regarding claim 17, Keyworth does not expressly disclose that the aqueous reactive extractive agent (sodium hypochlorite) further comprises a salt or acid form of mixed oxides of chlorine selected from the group consisting of chlorous acid, perchloric acid, chlorine dioxide, and mixtures thereof.

26. Sughrue teaches a desulfurization process that is enhanced by an oxidizing agent which includes perchloric acid, hypochlorites, and mixtures thereof (Abstract; p. 3, par. 0021).

27. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the process of Keyworth by including an oxidizing agent

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such as perchloric acid, as suggested by Sughrue, in the aqueous solution of sodium hypochlorite, in order to enhance the desulfurization capabilities.

### ***Response to Arguments***

28. Applicant's arguments with respect to claims 2, 3 and 6-20 have been considered but are moot, except as discussed below, in view of the new ground(s) of rejection.

29. Applicant argues with respect to claims 7-9, 11 and 13 that Eberly is not at all concerned with catalysts for the purpose of promoting the reaction between a reactive extractive agent and sulfur compounds present in a hydrocarbon feed.

30. This argument is not found persuasive because the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985). Namely, Eberly expressly teaches that the catalyst aids in sulfur removal from a hydrocarbon stream to immeasurable amounts. Therefore, in modifying the Keyworth reference, Examiner maintains that it would have been obvious to a person of ordinary skill in the art at the time of the invention to enhance the sulfur removal from the hydrocarbon stream in such a manner.

### ***Conclusion***

31. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RENEE ROBINSON whose telephone number is (571)270-7371. The examiner can normally be reached on Monday through Thursday 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on (571)272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. R./  
Examiner, Art Unit 1797

/Walter D. Griffin/  
Supervisory Patent Examiner,  
Art Unit 1797